Retention Measures and Reporting Systems

Gary Ropp
David Dickason
Tanja Blackstone

20030312 187

Retention Measures and Reporting Systems

Gary Ropp
David Dickason
Tanja Blackstone

Reviewed and Approved by
David M. Cashbaugh
Institute for Personnel Planning and Policy Analysis

Released by
David L. Alderton
Acting Director

REPORT DOCUMENTATION PAGE

Public reporting burden for this collection of information is limited to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE February 2003	3. REPORT TYPE AND DATE COVERED

4. TITLE AND SUBTITLE
Retention Measures and Reporting Systems

5. FUNDING NUMBERS
Program Element: 0604703N/ L1822
Work Unit: 03AR02

6. AUTHOR(S)
Gary Ropp, David Dickason, Tanja Blackstone

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Navy Personnel Research, Studies and Technology
Navy Personnel Command
5720 Integrity Drive
Millington, Tennessee 38055-1000

8. PERFORMING ORGANIZATION REPORT NUMBER
NPRST-TN-03-3

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
Chief of Naval Education (CNET)
250 Dallas Street
Pensacola, Florida 32508-5220

10. SPONSORING/MONITORING

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited.

12B. DISTRIBUTION CODE
A

13. ABSTRACT *(Maximum 200 words)*

This report details an effort commissioned by the Deputy Chief of Naval Operations, Manpower and Personnel (N1) and performed by the Navy Personnel Research and Development Center (NPRDC) to: (1) review current retention measures in use in the Navy, as well as the system used to distribute retention statistics, and (2) make recommendations for standardizing and improving the accuracy of retention measures, and for improving distribution of retention statistics. Information was gathered by reviewing background materials, including previous related reports and materials provided by retention experts. In addition, a large amount of information was obtained through face-to-face interviews with the retention experts, who included N1 retention analysts, Fleet career counselors at CINCPACFLT and CINCLANTFLT, and analysts at the DoD level and in the Assistant Secretary of the Navy, Manpower and Reserve Affairs office.

13. SUBJECT TERMS

Retention, reenlistment

15. NUMBER OF PAGES
16

16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UNLIMITED

Foreword

This report was prepared to summarize a study on officer and enlisted retention systems requested by the Director, Military Personnel Plans and Policy Division (N13) of the Bureau of Naval Personnel (BUPERS). Although the Navy relies on timely and accurate retention statistics to guide officer and enlisted personnel policies and programs, the statistics provided by existing reports are difficult to use and archive. This report reviews the various retention measures used in the Navy and makes recommendations for standardizing and improving the accuracy of retention measures, and for improving the distribution of retention statistics.

We appreciate the assistance of the many retention experts who provided information for this report, including representatives from the Deputy Chief of Naval Operations, Manpower and Personnel (N1), Fleet career counselors at Commander in Chief Pacific Fleet (CINCPACFLT) and Commander in Chief Atlantic Fleet (CINCLANTFLT), and analysts at the Department of Defense and in the Office of Assistant Secretary of the Navy, Manpower and Reserve Affairs.

DAVID L. ALDERTON
Acting Director

This Page Intentionaly
Left Blank

Executive Summary

Accurate, reliable, and timely retention measures are necessary for the Navy to efficiently develop and monitor effective officer and enlisted personnel plans, policies, and programs. A clear understanding of the retention environment enables the Navy to meet personnel manning requirements and set compensation policies. Existing problems with current retention measures and the system used to distribute these measures can be categorized into four broad areas: inaccurate statistics, conflicting measures, insufficient information, and difficulty in accessing information.

Data entry errors or incorrectly coded data processing routines create inaccurate statistics. This undermines confidence in the information and misdirects scarce resources by understating (or overstating) actual retention behavior. Different organizations develop idiosyncratic measures for differing purposes, which results in conflicting measures of retention. This leads to confusion, misunderstanding, and wasted time reconciling statistics. Insufficient information hampers organizations in directing resources where needed. Retention information not broken down to the appropriate level prevents Fleet counselors from detecting harmful retention trends in particular communities. The exclusion of United States Naval Reserve (USNR) reenlistments and short-term extensions from standard retention reports distorts the Navy's perception of retention, and may prevent the Navy from evaluating the effectiveness of alternatives in the context of overall retention. Difficulty in accessing retention information leads to bottlenecks and delays in reporting. Information can be outdated and of little use if the delay is extensive. Also, Fleet career counselors and headquarters' personnel managers are required to spend inordinate amounts of time accessing, manipulating, and preparing information for reports.

To remedy the problem of inaccurate statistics due to data entry errors or incorrectly defined variables in the statistics computation software, the Retention Reporting System should incorporate an error identification and correction capability to measure, monitor, and correct inaccurate information. Use of well-defined benchmark measures would resolve the problems associated with conflicting measures. We do not propose to limit the measures used in the Navy for analysis, but we do propose establishing a set of benchmark measures that can be used as standards throughout the Navy. We are proposing three benchmark rate measures: overall retention rate, reenlistment rate, and attrition rate. These measures address aspects of retention that are critical to the Navy. To solve the problem of insufficient information, the Retention Reporting System should provide comprehensive information. The information should cover all retention statistics of interest to headquarters and Fleet personnel, including detailed breakouts of all personnel categories of potential interest for setting retention policies. The problem of difficulty in accessing information would be solved by providing Internet access through a user friendly, graphically oriented interface to a sophisticated multi-dimensional, relational database capable of quickly retrieving, calculating, and displaying requested summary statistics.

**This Page Intentionaly
Left Blank**

Contents

Introduction

This report details an effort commissioned by the Deputy Chief of Naval Operations, Manpower and Personnel (N1) and performed by Navy Personnel Research, Studies, and Technology (NPRST). The purposes of this effort were to: review current retention measures in the Navy, as well as the system that distributes retention statistics, make recommendations for standardizing and improving the accuracy of retention measures, and make recommendations for improving distribution of retention statistics. Information was gathered by reviewing background materials, including previous related reports and materials provided by retention experts. In addition, a large body of information was obtained through face-to-face interviews with retention experts, which included N1 retention analysts, Fleet career counselors at Commander in Chiefs U.S. Pacific Fleet (CINCPACFLT) and U.S. Atlantic Fleet (CINCLANTFLT), and analysts at the Department of Defense (DOD), and in the Office of the Assistant Secretary of the Navy, Manpower and Reserve Affairs office.[1]

Background

In colloquial terms, retention is defined as:

Retention *n.* **1.** The act of retaining or the state of being retained.

And retain is defined as:

Retain *vt.* **1.** To keep or hold in one's possession.

While the dictionary definition is straightforward, there are many operational definitions in the Navy, thus retention means different things to different people. Most people in the Navy working with retention have an operational definition more specific than the above definition from *Webster's II New Riverside University Dictionary*. They are accustomed to thinking of retention in terms of indicators or measures (retention rates) that best describe the Navy's ability to retain people. Historically, enlisted retention was more closely monitored by the Navy than officer retention. Enlisted Sailors typically serve under a multiple-year enlistment contract, and under normal circumstances would not leave the Navy prior to completing the contract. Thus, many retention experts believe that Navy retention is best measured by the percentage of eligible enlisted Sailors who reenlist (commit to an additional multiple year contract) at the end of their current enlistment[2]. This "retention rate," which we will call the reenlistment rate to avoid confusion with other retention rates, is a very good indicator of the Navy's ability to retain people.

However, the reenlistment rate can also give a false picture of the Navy's ability to retain people. In times of increasing attrition (people leaving the Navy prior to completion of their enlistment contract), the Navy's ability to retain enlisted Sailors can decline despite a constant reenlistment rate. For this reason, many retention analysts incorporate an attrition factor into their "retention rate." In fact, this is the type of "retention rate" the Navy is required to report to DOD (DOD Instruction 1304.3). To further confound matters, DOD calls this rate a "reenlistment

---

[1] The techniques and instruments used to gather information for this report are contained in the Appendix.

[2] This is similar to the Net Retention Rate, found at the end of the Appendix.

rate," although the denominator includes attrition losses that could not possibly reenlist[3]. To distinguish this from the unadulterated reenlistment rate, let us call it the attrition-modified reenlistment rate.

In times of increasing short-term commitments (an increase in people committing to stay in the Navy for less than two years after completing an enlistment), the Navy's ability to retain people can improve despite a constant reenlistment rate. Some retention experts interviewed thought that recently more Sailors were staying in the Navy via short-term decisions. If so, then short-term extensions are also an indicator of the Navy's ability to retain people. Some retention analysts incorporate short-term extensions, attrition, and reenlistments into one retention rate, typically called a "continuation rate." This rate most closely fits the general definition of retention (the rate at which people are retained) by dividing the number of people who were in the Navy at the beginning of a time period into the number of people from the original group who remain in the Navy at the end of the time period. This type of rate also applies well to officers, who do not have enlistment contracts.

"Retention rates" may differ according to their function. DOD uses the rates reported by the Navy for "(1) personnel planning and program review, (2) analysis of the career attractiveness of military service, and (3) releases to the press, Congressional committees, other interested agencies" (DOD Instruction 1304.3), and N1 uses various retention measures to anticipate future personnel inventories for planning accessions, promotions, and endstrength. When personnel shortages or excesses are projected, N1 may institute policies, such as retention or separation incentives designed to alter the projected retention rate. For these targeted incentives, the retention metric used should be tailored to the targeted group. A typical example is the selective reenlistment bonus (SRB), which targets enlisted Sailors in specific skills and specific years-of-service zones, who are eligible to reenlist (and usually near the end of their enlistment contract). Fleet career counselors use retention metrics to gain a better understanding of where they should direct their retention programs (including efforts to reduce attrition). All of these tasks require consistent, reliable, accurate retention statistics as well as a system that can effectively collect, organize, and distribute these statistics.

Scope

This effort, bounded by time and resources, looked at only retention measures and their reporting, including actual measures of retention currently in use, statistics based on those measures, and the system used to distribute the statistics. We did not attempt to determine the reasons why personnel were staying or leaving the Navy.

Problem

Accurate, reliable, and timely retention information is necessary for the Navy to efficiently develop and monitor effective officer and enlisted personnel plans, policies, and programs. In addition, the system for collection, analysis, and distribution of retention statistics should enable system users to perform these tasks with undue effort. Unfortunately, the measures and information systems in use today do not meet these criteria. Current retention metrics are of

---

[3] This is similar to the Gross Retention Rate, found at the end of the Appendix.

questionable relevance and accuracy, and the existing information-delivery process is technologically obsolete.

Existing problems with current retention metrics and the system used to distribute this information fall into four broad areas: inaccurate statistics, conflicting measures, insufficient information, and difficulty in accessing information. Elaboration of each of these areas makes up the remainder of this section.

Inaccurate Statistics

Retention statistics can be inaccurate because of two different problems. The first occurs when information is incorrectly entered into the database used to compute retention. This might occur when a Personnelman at a Personnel Support Detachment or aboard ship makes an incorrect entry into the data system that is then uploaded to the Enlisted Master File (EMF) or Officer Master File (OMF). This type of error may occur initially because of a human mistake or misunderstanding what the correct entry should be. The error remains in the system because the database software does not perform the necessary checks to ensure that data are consistent with other known facts. A second cause of inaccurate retention measures occurs when the computer programming logic incorrectly defines a variable used in computing retention measures. For example, a code representing a type of loss or term of service can be or has been changed by one part of the organization without updating the software that calculates statistics based on this code. Another example of this kind of error is the "Year 2000" problem, where calculations such as years of service could be seriously misrepresented if based on a two-digit year rather than a four-digit year.

Inaccurate statistics lead to a number of dysfunctional consequences. The most significant is misdirection of scarce resources due to understating or overstating actual retention behavior. For example, if retention is understated, an unnecessary or excessive SRB might be implemented. Conversely, overstated retention information could cause a needed SRB to be improperly canceled. A second consequence is that, as personnel become aware of the inaccuracies, they lose trust and confidence in the retention statistics. During our field interviews, numerous personnel stated they did not "trust the numbers," referring to various retention statistics. While there was ample evidence from our interviews that data entry errors are widespread, the exact magnitude of the problem is unknown because the EMF and OMF are not systematically monitored for errors. Recent research suggests that large organizational databases are likely to have a significant volume of errors and that these errors are likely to be costly to the organization when decisions are based on erroneous information (Klein, Goodhue, & David, 1998).

Conflicting Measures

Retention statistics reported by different organizations often do not agree. One cause of this is the use of retention data collected at slightly different times. Fleet representatives stated that retention statistics published from headquarters are often more recent than information they have due to delays in receiving data. Further, as noted in Nakada (1983), terminology used in the area of retention is somewhat unclear, so that one organization's "reenlistment" is another organization's "extension." Moreover, the measures are often arrived at through differing

computational formulas. For example, Figure 1 displays two different methods of computing "retention" for enlisted personnel.

Reenlistment Rate w/
6YO Extensions

Reenlistment Rate w/o
6YO Extensions

(a)

(b)

Figure 1. Methods of computing "retention" for enlisted personnel.

Figure 1 illustrates the "Six-Year Obligation (6YO) problem." Six-year obligation contracts differ from the standard four-year contract because the additional two-year extension is automatic, dependent only on acceptable performance, not on personnel preferences. However, this two-year extension is counted as a first-term reenlistment in official Navy reports. This inflates actual retention rates. Figure 1(a) shows the effect of counting this involuntary two-year extension as a reenlistment. Figure 1(b) shows the same retention information if the involuntary two-year extension is not counted as a reenlistment. Both graphics count voluntary two-year extensions as a "stay" decision. In this case, counting the 6YO's two-year extension as a reenlistment raises the reenlistment rate by about four percentage points.

Conflicting retention statistics can lead to organizations spending inordinate amounts of time trying to understand and explain why one organization's retention statistics differ from another's. For example, in our review of retention documentation, reports often contained material explaining why retention information found within the report differed from retention information distributed by N1. Interviewees also related stories of having to reconcile their retention information with retention information distributed by N1 or published in the Navy Times.

Insufficient Information

Retention measures are often insufficient to answer questions that arise outside of the standard reports. Fleet counselors often need retention information categorized by rating, by geographical area, by gender, or by some other combination of demographic characteristics. This information is not provided in the reports they receive from headquarters. Also, some categories

of Navy personnel, such as United States Navy Reserve (USNR) and short-term extensions, are omitted entirely from the standard retention measures officially reported by N1. These omissions can result in a serious misrepresentation of how many people are staying in the Navy. For example, the retention statistic can be down, even if more people are staying in the Navy, due to an increase in USNR personnel reenlisting in the United States Navy (USN) or an increase in short-term extensions.

Insufficient information hinders organizations from directing resources where needed. Not having retention information broken down to the appropriate level prevents Fleet counselors from detecting harmful retention trends in particular communities. Not being able to monitor USNR reenlistments and short-term extensions in retention statistics causes the Navy perception of retention to be incomplete, and possibly distorted. This prevents the Navy from being able to evaluate the effectiveness of retention alternatives that may consider these categories in the context of the overall retention picture.

Difficulty in Accessing Information

The last problem area that was noted in the interviews was that of accessing needed information. There is not a standardized system for obtaining retention information, nor is there a standard format. Organizations receive information on tapes, microfiche, and through electronic download. Once they have the information, the ability to manipulate it is dependent on "local" talent. Organizations use a variety of software such as spreadsheets, word processors, databases, and presentation packages to manipulate and prepare information for reporting purposes.

Difficulty in accessing retention information leads to bottlenecks and delays in reporting. Information can be outdated and of little use if the delay is long. Also, Fleet career counselors and N1 personnel managers are required to spend inordinate amounts of time accessing, manipulating, and preparing the information for report purposes. This is especially true of retention information regarding communities who have a high proportion of 6YOs, because of the need to account for automatic extensions.

Discussion

Measures

One major problem noted with N1 retention measures is that they do not correctly account for 6YOs. Again, 6YO contracts differ from the standard four-year contract in that the additional two-year extension is automatic, dependent only on acceptable performance, not on personnel preferences. However, in official Navy retention reports this two-year extension is counted as a first term reenlistment. This inflates actual retention rates and necessitates 6YO communities to manually count their personnel to determine actual retention behavior.

Also, USNR personnel are not incorporated into N1 retention reports that are sent out to the Fleet. Fleet counselors would like to keep track of Naval Reserve personnel serving on active duty because many of these personnel enlist USN, and while on active duty, USNRs perform similar jobs under commitments similar to those incurred by USN personnel. A third problem is that extensions of less than two years are not accounted for in the N1 reports. Obviously, a four-

or six-year reenlistment is of greater value to the Navy, but extensions of less than two years are perceived as having become increasingly common. Extensions of less than two years are a commitment to serve and have significance for retention and personnel planning.

The problems found in the N1 retention statistics are passed down to the local level. Fleet commands primarily use gross and net retention measures,[4] which they receive from N1. The gross measure can be seen as an overall retention measure while the net retention measure is more properly a measure of reenlistment with respect to a pool of eligibles. Fleet personnel prefer the gross retention measure because they believe the net retention measure is open to manipulation by local commands through redefining who is "eligible to reenlist." The distinction between gross and net measures does highlight the issue of identifying personnel who can make a voluntary decision with regard to staying in or leaving the Navy. The ability to identify personnel who have a choice about remaining in the Navy has importance in developing models used for projecting retention trends.

Fleet career counselors in particular expressed the need to have more information concerning measures of attrition that break out the reasons why personnel are leaving the Navy prior to the end of their service obligation. This would give the counselors the ability to better focus their retention programs on those groups that are important for the Navy to retain, yet experience high attrition rates. Another significant issue among retention experts is whether to include an attrition term in the denominator of a retention rate measure. If retention is used to manage the size of the personnel force, and the rate of attrition affects the size of the force, some interviewees thought attrition should be incorporated into a general retention measure. This would help planners to know how many personnel overall must be recruited into the Navy to maintain a specific force size. There was also interest in tracking cohort attrition and retention over multiple years.

Typically, enlisted retention statistics have been calculated by term of enlistment, usually first term, second term, and career. While this allows for differentiating retention behavior according to career decision points, it also introduces some problems. For example, USNR personnel who reenlist as USN are then considered to be in their first term in the USN. If they then reenlist at the seven year point in their career, the current measure counts the re-enlistment as a first term reenlistment. Also, short-term extensions do not change the term of enlistment, so a Sailor can execute numerous short-term extensions for several years after the first or second enlistment and not advance to the next career point in the retention statistics. These inconsistencies in the rules lead to instances where second term reenlistees can have more time in service than career reenlistees, and first termers can have more time in service than second termers. The SRB is a major tool for shaping retention, and yet SRBs are awarded according to experience, i.e., years-of-service zones, rather than by term of service. It might be better for planning and analysis to use SRB zones, which correspond to the enlistment terms, but give a better indication of actual experience.

Some measures that are appropriate for enlisted retention are not appropriate for officer retention, because officers do not generally obligate to multiple years of service beyond their initial minimum service requirement (MSR). Exceptions are officers who make multiple year commitments to accept a bonus or special training. Because of this, officer retention management is less concerned with reenlistment or end of active obligated service (EAOS)-related behavior,

---

[4] Definitions for both measures can be found at the end of the Appendix.

and reenlistment and attrition rates are less useful measures for officer retention. As a result, continuation rates have been primarily used with the officer force. A continuation rate measures how many officers who were in the Navy at the beginning of a particular year remain in the Navy at the beginning of the next year. Officer retention management is also concerned with retaining officers until they reach key career milestones, e.g., Department Head tours and screening for Executive Officer. Because of this, officer retention managers like to use a statistic that will tell them how many of a cohort of new officers will remain after several years. An example of this is the cumulative continuation rate, which multiplies together the continuation rate for each officer year-group from MSR to the desired career target. For example, the continuation rate for year-groups with five, six, seven, and eight years of service could be multiplied together to obtain a cumulative continuation rate. Alternatively, a cohort continuation rate could be obtained by calculating the percentage of a yeargroup cohort that is left after several years.

Systems

The headquarters retention information system is based on a mainframe computer platform running a Cobol software program. Enlisted data is stored in the EMF and officer data is stored in the OMF. These files are updated daily, and monthly downloads are used to compute statistics. Both standardized and customized reports are generated from these data files. N1 also sends various "data extracts" in differing media to outside organizations. According to various interviewees, the software program was developed 20-25 years ago and it is difficult to implement changes to the code. Reports are developed using a variety of different measures but all output appears in table format. No use of recent advances in graphical user interfaces was noted.

Local level systems vary greatly. CINCPACFLT and CINCLANTFLT receive data extracts from PERS-31. Subordinate commands then receive data from CINCPAC and CINCLANT relevant to their command. Timeliness of the receipt of data is often a concern. Subordinate commands use a variety of database, word processing, spreadsheet, and graphics presentation software to manipulate the data and prepare reports. The sophistication of any particular system depends on local resources and the computer skills of personnel. Another significant problem that local organizations encounter is the granularity of the information that they are able to access. Oftentimes, they are called upon to answer questions that require a finer-grained analysis of the information than is possible with the information on hand.

Recommendations

Error Identification and Correction

To remedy the problem of inaccurate statistics due to data entry errors or incorrectly defined variables in the statistics computation software, an automated error identification and correction capability should be incorporated into the Retention Reporting System. By employing such a facility, the actual extent of erroneous data can be measured and monitored. In addition to immediate correction of data errors where practical, this facility should be used to provide feedback to data entry managers regarding the quality of the data and common types of errors. Some errors will probably escape automatic detection, so the Retention Reporting System should

also enable users to provide feedback when they discover inaccurate information. This will not directly correct the errors, but it will provide documentation of errors that cannot be detected via the automated error identification capability.

Benchmark Measures

While it is beneficial to have a wide variety of different measures available to analysts to study different aspects of retention, it is necessary for the organization as a whole to settle on a limited set of measures to use as a benchmark. The benchmark measures should be well defined, and the number of benchmark measures should be the minimum required to measure the aspects of retention that are most critical to the Navy. Use of these measures will resolve the problems associated with conflicting measures. We do not propose to limit the measures used in the Navy for analysis, but do propose establishment of a set of benchmark measures that can be used as a standard throughout the organization.

The current gross retention rate is widely considered the most useful measure. It can be computed for any given time period (usually monthly, annual, or year-to-date) using the following formula.

$$\text{Gross Retention Rate} = \frac{\text{Reenlistments + Long term extensions (LTE)}}{\text{Reenlistments + Losses + LTE}}$$

This rate has some serious deficiencies. The main problem is the inclusion of all losses in the denominator. This is how it accounts for attrition (losses prior to EAOS) in addition to losses at EAOS. The result is that the rate cannot be used to accurately measure reenlistment behavior, because it is contaminated by the attrition behavior, and it cannot be used to measure attrition behavior because there is no early loss information in the numerator. If it is intended to represent a combination of reenlistment and attrition, a simple continuation rate (which we will call Overall Retention) is more direct and easier to interpret.

We are proposing three benchmark rate measures: Overall Retention Rate, Reenlistment Rate, and Attrition Rate. These three measures will cover the aspects of retention that are most critical to the Navy. The overall retention rate gives a clear indication of the rate at which people are leaving/staying. Reenlistment and attrition are two different management challenges, and they each require a separate measure if they are to be tracked accurately. All measures would be reported on a twelve month rolling average as opposed to the current year-to-date method, so that measures reported early in the year will have comparable validity with those reported late in the year. They would be reported by years of service, and by years-of-service groups corresponding to SRB zones. USN and USNR personnel would be combined for the benchmark measure.

Overall Retention Rate

We propose discarding the precept that retention should be restricted to long term commitments, and adopting a definition of retention that includes all significant factors concerning staying/leaving the Navy, including reenlistment, attrition, and short-term extensions. This overall retention rate provides a flexible concept of retention that allows for a possible shift from the long-term to short-term mindset, and provides a similar measure for both officer and

enlisted forces. Also known as a continuation rate, it would be measured by counting how many personnel (in any desired category) were in the Navy at Time 1, then counting how many of those personnel were still in the Navy at Time 2 (usually one year later), expressed as a percentage. The formula is given below:

$$ORR_{i,t} = \frac{N_{i,t+1}}{N_{i,t}}$$

Thus, it would be an indicator of the percentage of people staying/leaving the Navy in a given year, without regard to conditions such as expiration of enlistment or type of loss. This would give the Navy a simple measure to track the rate at which people are leaving the force.

Reenlistment Rate

Although the Navy needs a measure that tracks the overall rate at which people are leaving the force, the primary method by which enlisted personnel are persuaded to make a career of the Navy is through reenlistment, and this is the retention area where most effort and resources are directed. Thus, a standard measure for this important aspect of retention is needed. The proposed Reenlistment Rate is similar to previous retention rates, and the formula for this measure is:

$$\frac{\textbf{Reenlistments + Voluntary Long Term Extensions (VLTE)}}{\textbf{Reenlistments + VLTE + EAOS losses}}$$

This measure gives the percentage of personnel who, having reached (i.e., within six months) EAOS, have decided to reenlist or voluntarily extend for at least 24 months. The six-month window before EAOS was chosen to account for people who have essentially satisfied their enlistment obligation, but might be released a few months early for the convenience of the Navy. Including only voluntary long-term extensions resolves the previously mentioned 6YO problem, because their two-year extensions are not voluntary.

The reenlistment rate measure would allow the Navy to evaluate its performance in convincing people to make a long-term commitment to "stay Navy." It disregards people who make short-term extensions and people who leave the Navy prior to the end of their original commitment. This also precludes manipulating the statistics by redefining reenlistment eligibility since reenlistment eligibility is not a factor in this measure. This measure would be applicable to enlisted personnel only.

Attrition Rate

This measures the rate at which personnel who are under contract to stay in the Navy are actually leaving prior to (i.e., more than six months before) their EAOS. It is essentially the complement of the reenlistment rate in that the reenlistment rate applies to personnel who have completed their contractual obligation to the Navy, while the attrition rate applies to those who have not. The formula for this measure would be:

$$\frac{\textbf{Losses prior to EAOS}}{\textbf{Personnel not at EAOS}}$$

Because the personnel not at EAOS will vary throughout the year, this measure would be calculated monthly, based on the people who are not within six months of EAOS during the

month. The monthly rate would be averaged over a twelve-month period to obtain an annual rate. It would be a valuable measure for rating the Navy's ability to keep Sailors who are under contract in any given time frame. This measure would be applicable to enlisted personnel only.

Although the information displayed by the Retention Reporting System would not be limited to the benchmark measures, the benchmark measures would be clearly identified as the primary measures. These measures would be reported in a standardized report module, while other statistics would be accessed separately.

Comprehensive Information

To solve the problem of insufficient information, the Retention Reporting System should provide as much information as can be gathered on retention. The information should cover all retention statistics of interest to N1 and the Fleet. It should include detailed breakouts of all personnel categories to include USN/USNR status, rating, gender, ethnicity, region, duty type, ship type, grade, Career Reenlistment Objectives (CREO) group, longevity, dependency, length of obligation, enlistment term, EAOS status, bonus available, incentive programs offered, and marital status. The measures provided should not be limited to the benchmark measures, but should include all measures of interest, including measures that have been provided historically. Cumulative and cohort continuation rates and attrition rates should be provided for officers and enlisted, with the capability for the user to select the number of years to cover. In addition to the various retention-related rates, raw numbers should be provided on extensions, reenlistments, and officers accepting bonus/education obligations (by number of months obligated), separations (by type), and inventory (by months remaining on contract). Users should be able to aggregate or disaggregate the information as necessary. Information should be provided for as many previous years as possible, by month, quarter, and year; and the system should be updated monthly.

Internet Access

The proposed system would be implemented in a user friendly, graphical interface to a sophisticated multi-dimensional, relational database with the capability of quickly retrieving, calculating, and displaying requested summary statistics. This interface would be accessed via the Internet, and would allow users to download numeric and graphic representations of the requested statistics. This approach would remedy the problem of difficulty in accessing information. It would also permit central maintenance of the system, allowing for timely updates of the information and simultaneous access to the same information by users all over the world. If desired for security reasons, access could be limited to authorized users via password protection.

Bibliography

Cooke, T. W., Marcus, A. J., & Quester, A. O. (1992). *Personnel Tempo of Operations and Navy Enlisted Retention.* Alexandria, VA. Center for Naval Analysis.

Glaser, D. N., (1996). *The Effect of Quality of Life Factors on Turnover and Performance in the Private Sector: A Literature Review.* San Diego: Navy Personnel Research and Development Center. (NPRDC-TN-96-38).

Griffis, H. S. & Sharma, R. (1995). *Implications of Changes in Time Spent at Sea.* Alexandria, VA. Center for Naval Analysis.

Griffis, H. S., Lockard, J. S., Morehouse, B., & Moore, C. (1995) *FY 1994 Second Term Retention.* Alexandria, VA. Center for Naval Analysis.

Griffis, H. S., & Lockard, J. S. (1996) *Navy Enlisted Retention Quality,* Alexandria, VA. Center for Naval Analysis.

Keller, P. R., & Keller, M. M. (1993). Visual Cues: Practical Data Visualization. *IEEE Computer Society Press.*

Klein, B. D., Goodhue, D. L. & Davis, G. B., *Can Humans Detect Errors in Data?: Impact of Base Rates, Incentives, and Goals,* http:// www-personal.umd.umich.edu/~bdklein/, 1998, pp. 1,2.

Mackin, P. C., Mairs, L. S., & Darling, K. (1996) *Effectiveness of Alternative Officer Retention Measures.* SAG Corporation.

Nakada, M. K., & Boyle, J. P. (1996) *Nuclear Officer Retention: An Economic Model.* San Diego: Navy Personnel Research and Development Center. (NPRDC-TR-96-25)

Nakada, M. K., Mackin, P. C., & Mackie, C. D. (1996) *Nuclear Officer Retention: MSR and Beyond.* San Diego: Navy Personnel Research and Development Center. (NPRDC-TR-97-1)

Nakada, M. K., Mumm, R. H., & Curtis, E. W. (1983). *A Digest of Retention Terms: Definition and Historical Values.* San Diego: Navy Personnel Research and Development Center. (NPRDC-SR-83-24)

Su Y. L., & Silverman, J. (1993) *Standard Personnel Measures: Rules for Processing Enlisted Personnel Records.* San Diego: Navy Personnel Research and Development Center.

References

Department of Defense Instruction 1304.3. (July 29, 1964). *Reenlistment Rate Reports.*

Glaser, D. N., (1996). *The Effect of Quality of Life Factors on Turnover and Performance in the Private Sector: A Literature Review.* San Diego: Navy Personnel Research and Development Center. (NPRDC-TN-96-38).

Klein, B. D., Goodhue, D. L. & Davis, G. B., *Can Humans Detect Errors in Data?: Impact of Base Rates, Incentives, and Goals,* http:// www-personal.umd.umich.edu/~bdklein/, 1998, pp. 1,2.

Mackin, P. C., Mairs, L. S., & Darling, K. (1996) *Effectiveness of Alternative Officer Retention Measures.* SAG Corporation.

Nakada, M. K., & Boyle, J. P. (1996) *Nuclear Officer Retention: An Economic Model.* San Diego: Navy Personnel Research and Development Center. (NPRDC-TR-96-25)

Nakada, M. K., Mumm, R. H., & Curtis, E. W. (1983). *A Digest of Retention Terms: Definition and Historical Values.* San Diego: Navy Personnel Research and Development Center. (NPRDC-SR-83-24)

Su Y. L., & Silverman, J. (1993) *Standard Personnel Measures: Rules for Processing Enlisted Personnel Records.* San Diego: Navy Personnel Research and Development Center.

Appendix

Review of Prior Studies

Prior work performed in the area of retention was looked at primarily for two reasons: to see what retention measures, if any, had been previously proposed, and to gain a fuller understanding of the issues involved in the area of retention.

Recent work (previous six years) on enlisted retention focused more on retention trends and causes of retention instead of the actual retention measures. Published reports (all from the Center for Naval Analysis) include:

1. *Personnel Tempo of Operations and Navy Enlisted Retention,* 1992

2. *Implications of Changes in Time Spent at Sea,* 1995

3. *FY 1994 Second Term Retention,* 1995

4. *Navy Enlisted Retention Quality,* 1996

It is interesting to note that numbers three and four (both annotated briefings) have material devoted to explaining why the retention rates used do not match retention rates from N1.

Work at NPRST includes material related to the impact of "Quality of Life" programs on retention (Glaser & Dutcher, 1994), although this did not examine the measures or the retention system. Another effort by Su and Silverman (1993) attempted to develop a standard personnel measure for use in identifying "meaningful changes to Navy strength and to classify those changes (gains, losses, retention, grade movements) into various categories" (pg. 1). It is unclear to what extent this measure is in current use.

Work more pertinent to the present study (but older) includes "A Digest of Retention Terms: Definition and Historical Values" (Nakada, Mumm, & Curtis, 1983). This report details definitions, reference material, mathematical formulas for terms if applicable, and historical values, if available. Recommendations from this report include using continuation and survival rates in retention research. There were no reports found detailing the system used for the collection, analyses, and distribution of enlisted retention information.

The area of Officer retention has also been the focus of recent research. Nakada and Boyle (1996) investigated the effect of the Nuclear Officer Incentive Pay program on nuclear officer retention. They developed arguments for using econometric models to predict officer retention. Nakada, Mackin, and Mackie (1996) expanded on this work by simulating the effect on retention of alternative retention bonus strategies. In both studies, retention pay-elasticities were found useful for modeling Officer retention. Mackin, Mairs, and Darling (1996) looked at both retention measures and the Officer retention reporting system. Retention measures in the study included spot continuation rates, mean service requirement (MSR) survival rates, and cumulative continuation rates. They concluded that a retention measure for officers should have three key attributes:

1. The retention statistic must be clearly linked to the underlying behavior of the individual examined.

2. The retention statistic should be targeted to a year group cohort.

3. The retention statistic must be directly linked with the empirical measurements and econometric estimations underlying the projection methodology (pg.16).

Mackin et al. also concluded that an Officer retention system should have both standardized retention output and a query capability to generate customized retention reports.

Interviews

Our primary source of information for this report was obtained through face-to-face interviews using a structured interview protocol. The majority of personnel interviewed were Fleet counselors at CINCPACFLT and CINCLANTFLT, and N1 retention experts. Analysts at the DOD level and in the Assistant Secretary of the Navy, Manpower and Reserve Affairs office were also interviewed. A summary of responses to selected questions follows. Interview questions are in boldface and italic.

What retention definition do you use?

The standard measure for determining overall retention is that of gross retention. Fleet counselors related that gross retention is the most useful for them. They felt that net retention (including only eligibles) was too easily manipulated by defining someone who did not want to reenlist as "ineligible" thus giving an inaccurate retention rate. Formulas for gross and net retention are given at the end of this section.

How do you currently use retention measures?

The use of retention information varies by organizational level. Fleet counselors use enlisted retention measures for several purposes, but the primary purpose is to identify problems in achieving retention goals. They are also asked to respond to various information requests by their superiors and by outside organizations. Depending on the level of expertise, some end users measure trends in retention or attempt to determine the effect of present policies on retention rates.

N1 is the primary source of retention information within the DON. They generally distribute retention information through a series of standardized reports from the Manpower and Personnel Management Information System. These reports go to numerous organizations both within and outside of the Department of the Navy. They also respond to individual requests from various organizations on an ad hoc basis.

The Department of Defense uses retention rates in response to requests from Congress and other organizations, often to assist in budgeting decisions, for personnel planning and program review, and to analyze the career attractiveness of military service.

What software do you use in obtaining, manipulating, and reporting retention data?

There is no standard software package or interface for any of the above tasks. The source of retention data at N1 is a mainframe computer using COBOL software code written some 20–25 years ago. N1 has the capability to distribute this data in almost any media format, from hardcopy reports to CD-ROM. Fleet commands use various software packages to interact with retention data. We encountered such software packages as spreadsheets, databases, presentation graphics, and word processors. Data was distributed by microfiche, e-mail, paper, electronic transfer via modem, and data tape. The system used by the local commands was entirely dependent on

whether they had access to computer resources, including personnel skilled in computer operations.

Problems with current definition of retention

The most common complaint of the current definition of retention was that concerning 6YO obligators. These personnel have an initial contract of four years plus a two-year automatic extension. Currently at N1, this two-year extension is counted as a first-term reenlistment although it is not a voluntary action.

Recommended changes or enhancements in retention definition/methodology

The most frequent recommendation was to not count the 6YOs automatic two-year extension as a reenlistment and to use a measure of retention that included ineligibles in the measurement computation. Counselors also wanted to be able to track USNRs because this group is likely to become career military. Increased and more timely access to the raw retention data was also a frequent request. Counselors find it very difficult to respond to some requests for retention information because of their inability to disaggregate the information to the level they need. Counselors would like to be able to have retention information by rating. This would allow them to focus their efforts on retaining those specific personnel who are most urgently needed for the Navy.

Do you have to make any manual calculations with the retention measures you use?

Some commands reported having to manually enter the data they needed so that it could be manipulated or analyzed. This was especially prevalent when dealing with 6YO personnel.

Are there any issues that we did not address?

Most interviewees wanted to see more specific tracking of attrition. Fleet counselors were particularly interested in understanding why personnel were leaving the Navy. Another issue was that of having an all-Navy goal for retention. Counselors thought that it was more important to track retention by rating. They related that when all-Navy goals are issued those goals become the priority and they have no leverage in trying to focus on particular ratings that may be critical to the Navy's readiness.

Gross and Net Retention Formulas

$$\text{Gross Retention Rate} = \frac{\text{Reenlistments + Long term extensions (LTE)}}{\text{Reenlistments + Losses + LTE}}$$

$$\text{Net Retention Rate} = \frac{\text{Reenlistments + LTE}}{\text{Reenlistments + Eligible losses + LTE}}$$

Distribution List

Assistant Secretary of the Navy (Manpower and Reserve Affairs)
Deputy Assistant Secretary of the Navy (Manpower and Reserve Affairs)
Chief of Naval Operations (N1), (N1B), (N091), (N813)
Office of Naval Research (Code 342)
Chief of Naval Personnel (PERS-00), (NPC-00B), (PERS-00W), (PERS-00H),
(NPC-02), (PERS-20), (PERS-22), (PERS-234), (PERS-04), (PERS-46), (NPC-05),
(NPC-6), (NPC-6C), (NPC-6E), (PERS-63), (NPC-662D), (PERS-7)
Commander in Chief, U.S. Atlantic Fleet (N1)
Commander in Chief, U.S. Pacific Fleet (N1)
Commander in Chief, U.S. Naval Forces, Europe (2)
Naval Postgraduate School
Director of Research, U.S. Naval Academy
Pentagon Library
Defense Technical Information Center (DTIC) (1)